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Possibility of an American Source of Potash

W. A. Worsham, Jr.,
Professor Agricultural Chemistry

A great deal of interest is being manifested at the present time in the potash situation. Owing to war conditions our chief source of potash has been cut off and the scarcity and high price render its use for fertilizer purposes impossible. The United States has always depended on Germany for potash and has taken about one-fifth of its total output, which amounts to the equivalent of about 400,000 tons of pure muriate of potash annually. The output of the German potash mines and the sale of the material is regulated by the German government.

On account of the soluble form in which the German potash salts occur and the high potash content, it is probable that we must look to this source for our supply of cheap potash for a number of years to come. This does not mean that we have no sources of potash in America. Raw potash material is abundant but none of it contains so high a per cent of potash or potash so available as the German supply.

The present conditions of high priced potash is giving a great stimulus to the exploitation of the potash resources of the United States. It is not a question of supply but one of extracting the potash in an available form and putting it on the market sufficiently cheap to make its use for fertilizer purposes possible. The sources to which we must look for a supply of potash are the kelp beds of the Pacific coast, the potash rocks or feldspars which are widely distributed, and deposits of soluble potash salts in the semi-arid region of the United States.

Kelp a Source of Potash

The United States Department of Agriculture in its investigations of kelp as an American source of potash salts, has mapped practically all of the kelp beds of the Pacific coast. From these surveys it is estimated that there are 390 square miles of kelp beds producing annually 59,300,000 tons of fresh kelp, equivalent to 2,226,000 tons of potassium chloride or about six times as much as is now imported into the United States. The havesting of all this kelp is not probable in the near future, but it shows that we are independent of any other country so far as a source of potash is concerned.

Of course the chief interest of the farmer in kelp is in its value as a fertilizer or as a source of potash for agricultural purposes. The average analyses of many samples of dried kelp show that it has a potash content of about 16 per cent, a nitrogen content of about 2 per cent, and some phosphoric acid. Dried kelp decomposes very readily in the soil and, therefore, can be ground and applied directly as a fertilizer or it may be mixed with fish or tankage and some phosphate material, thus making a complete fertilizer. Several commercial organizations have erected plants and are attempting to utilize kelp as a fertilizer material. Unfortunately, this source is too far away from the South Atlantic states which are the greatest consumers of commercial fertilizers. The material is rather bulky and freight rates have made its use in the south prohibitive, though it is being used quite extensively as a fertilizer on the Pacific coast.

The potash salts in kelp can be rather easily extracted and concentrated, and since the kelp can be harvested very cheaply it promises to be one of the most practical sources of potash fertilizer in the United States.

Feldspar a Source of Potash

The demand for an American supply of potash in available form for agriculture has not only stimulated search for potash from kelp, but from feldspars and fieldspatic rocks in which are locked up a vast amount of it. The problem is to treat these materials in such a way as to render the potash water soluble or sufficiently soluble in dilute acids to be used for agricultural purposes. The rocks which contain the potash are insoluble silicates of potash and aluminum. In some of them the potassium is replaced by sodium. Feldspars containing from 10 to 12 per cent of potash, however, occur abundantly and are well distributed throughout the United States.

The lower content of potash and its insoluble form as compared with the German potash salts, have made the cost of production too great to compete with the German supply under normal conditions.

The chemical and engineering problems of rendering the potash from feldspars available have been worked out, but the cost is too great to make working the material for potash alone practical. Many patents have been granted for the processes and it is hoped that by making use of the aluminum and other by-products, this source may yet become a commercial possibility. The writer has been informed that there is an inexhaustible supply of feldspatic rock in Georgia containing at least 10 per cent of potash and 35 per cent of aluminum oxide and that a process has been devised and a company organized to work this material for the aluminum, thus obtaining the potash as a by-product. If this is true, this may soon become a commercial source of potash. This plant, however, has not been put in operation and our immediate needs of potash for agricultural purposes cannot be supplied from this source. It is the belief of the writer that the cost of potash will be too great as long as the present European war lasts, to be used for agricultural purposes. The fear of a cheap and large supply from the Stassfurt mines after the war has ended, hinders capital from investing heavily in producing potash from American sources. It is believed that the potash industry of America can only be successfully developed when the government offers protection in the way of tariff. Whether or not this will benefit the agricultural classes is doubtful.

Alunite a Source of Potash

There are deposits of potash salts in the semi-arid regions of the west which are likely to become the most immedite source of potash. Potash from these deposits is being put on the market at the present time by some of the fertilizer manufacturers, but the demand for its uses, such as the manufacture of war munitions, renders the price so high that little of it will find its way into mixed fertilizers. This supply is limited to probably less than fifty tons per day. The material being worked is called alunite which is a hydrated basic potash alumn and on account of its being made soluble very easily the cost of separating it from the aluminum is not so great.

Use of Fertilizers for the Present Year

On account of the scarcity and high price of potash very little of the mixed fertilizers offered for sale will contain potash salts. Many unwarranted claims may be made as to the potash content of fertilizers which contain only the potash which occurs naturally in such material as cottonseed meal or that which may be present but not available. The farmer can not be too careful in purchasing mixed fertilizers. Practically all material for manufacturing fertilizers is above normal in price, and it is a question whether the extensive use of mixed fertilizers will be profitable or not.

Provided the farmer can secure cottonseed meal sufficiently cheap, it appears that a mixture of acid phosphate and cotton seed meal will be the best fertilizer to be used, as the cottonseed meal will contain a small per cent of available potash. If the price of cottonseed meal is prohibitive, other sources of nitrogen, such as tankage and dried blood, may be used.

Experiments carried out by the Department of Agronomy of the College seems to indicate that potash does not pay for general crops, especially in the central and northern parts of the state. Chemical analysis shows that most of these soils contain a liberal supply of potash locked up in them. This may be liberated by deep plowing, the addition of organic matter and the proper use of lime, and it is better for the farmer to rely on this source for supplying the crop with potash at present than to depend on the commercial supply.

Lye Potash

Many inquiries are coming to the College as to the value of ball potash or the so-called potash lyes. The writer is informed by good authority that these materials are being offered for sale in certain sections of the state for use in mixing fertilizers as a substitute for the potash salts ordinarily used. The term "potash" used in naming these materials is a mis-nomer. They are simply sodium hydroxide, or soda lye, and contain no potash whatever. These lyes are put on the market for use in making soap and for this purpose the soda lye is as good as the potash lye. It makes a harder soap and is very much cheaper. The properties of the two substances are very similar. They are both strong caustic alkalies and for most purposes one may be used as a substitute for the other, but we can never substitute a sodium salt for a potash salt as a plant food. We can not fool the plant. It calls for potash and must have potash.

The farmer may be fooled into using soda lye as a potash fertilizer, but the plant refuses it and all the lye does is to burn up the humus,—the one thing our soils need so badly and the one thing we are trying so hard to supply. Experience teaches us that strong lye will burn the skin readily and it burns all forms or organic matter in the same way. If used close to seeding time, there is great danger of injury to germination of the seed. If these lyes were potash lyes they would be worth more than $500.00 per ton. The offer of these substances cannot be too strongly condemned and the farmers of Georgia are warned against their use.

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